

\*\*\*\*\*

=> s calculator#

L1 12878 CALCULATOR#

=> s handwrit####

L2 1813 HANDWRIT####

=> s l1(2p)l2

L3 33 L1(2P)L2

=> d l3 1-33

1. 5,428,805, Jun. 27, 1995, Method and apparatus for recognizing and performing handwritten calculations; Michael W. Morgan, 395/800; 345/173, 179; 364/231.2, 231.3, 231.31, 237.2, 237.5, 286.1, 286.3, DIG.1 [IMAGE AVAILABLE]
2. 5,396,443, Mar. 7, 1995, Information processing apparatus including arrangements for activation to and deactivation from a power-saving state; Michihiro Mese, et al., 364/707 [IMAGE AVAILABLE]
3. 5,315,667, May 24, 1994, On-line handwriting recognition using a prototype confusability dialog; Tetsunosuke Fujisaki, et al., 382/187, 311 [IMAGE AVAILABLE]
4. 5,303,312, Apr. 12, 1994, Handwriting recognition by character template; Liam D. Comerford, et al., 382/189, 182, 209, 254 [IMAGE AVAILABLE]
5. 5,299,295, Mar. 29, 1994, Method and apparatus for electronically  
08 SEP 95 11:02:08 U.S. Patent & Trademark Office P0003  
viewing, printing, and registering checks; Donald Y. Kim, et al., 395/111, 117 [IMAGE AVAILABLE]
6. 5,294,792, Mar. 15, 1994, Writing tip position sensing and processing apparatus; Russell F. Lewis, et al., 250/221, 226; 345/163, 180; 382/121, 188 [IMAGE AVAILABLE]
7. 5,278,673, Jan. 11, 1994, Hand-held small document image recorder storage and display apparatus; James R. Scapa, et al., 358/473; 348/536; 358/472 [IMAGE AVAILABLE]
8. 5,276,794, Jan. 4, 1994, Pop-up keyboard system for entering handwritten data into computer generated forms; Arthur C. Lamb, Jr., 395/149; 345/173; 382/189; 395/157, 161 [IMAGE AVAILABLE]
9. 5,271,068, Dec. 14, 1993, Character recognition device which divides a single character region into subregions to obtain a character code; Toru Ueda, et al., 382/216, 156, 220 [IMAGE AVAILABLE]
10. 5,258,935, Nov. 2, 1993, Self-inputting checkbook accounting device; Michael J. Ure, 364/705.02, 705.03, 709.11 [IMAGE AVAILABLE]
11. 5,241,489, Aug. 31, 1993, Electronic computer with fraction and exponent display; Hideyasu Koumo, et al., 364/710.1 [IMAGE AVAILABLE]

12. 5,233,547, Aug. 3, 1993, Electronic checking account apparatus and method having a digitizer to receive information as a check is being written; Michael A. Kapp, et al., 364/705.02; 235/380; 364/709.11 [IMAGE AVAILABLE]
13. 5,187,351, Feb. 16, 1993, Processing of bank documents; John G. Clary, 235/379, 449, 454; 902/5 [IMAGE AVAILABLE]
14. 5,161,245, Nov. 3, 1992, Pattern recognition system having inter-pattern spacing correction; David Fenwick, 382/231, 177, 310; 395/63 [IMAGE AVAILABLE]
15. 5,151,951, Sep. 29, 1992, Character recognition device which divides a single character region into subregions to obtain a character code; Toru Ueda, et al., 382/156, 195 [IMAGE AVAILABLE]
16. 5,133,076, Jul. 21, 1992, Hand held computer; Jeff C. Hawkins, et al., 395/800; 364/231, 231.1, 231.2, 709.09 [IMAGE AVAILABLE]
17. D 324,673, Mar. 17, 1992, Electronic computer; Masaaki Iino, D14/106 [IMAGE AVAILABLE]
18. 5,023,918, Jun. 11, 1991, Cross-product filter; James S. Lipscomb, 382/260, 187, 197, 202 [IMAGE AVAILABLE]
19. 4,899,137, Feb. 6, 1990, Arrangement for the input and processing of characters and/or graphic patterns; Herbert Behrens, et al., 345/168; 178/18; 341/5; 345/173 [IMAGE AVAILABLE]
20. 4,875,634, Oct. 24, 1989, Paper tape roll control unit; Theodore Lapadakis, 242/521; 235/58CF; 242/538.1, 538.3, 543, 546 [IMAGE AVAILABLE]
21. 4,771,268, Sep. 13, 1988, Character recognition device; Hironao Sone, et al., 341/22, 5; 382/188 [IMAGE AVAILABLE]
22. 4,763,356, Aug. 9, 1988, Touch screen form entry system; Benjamin W. Day, Jr., et al., 379/368; 178/18; 345/113, 173, 902; 364/DIG.2; 379/201, 396; 395/100, 149, 155, 161 [IMAGE AVAILABLE]  
08 SEP 95 11:02:15 U.S. Patent & Trademark Office P0004
23. 4,737,911, Apr. 12, 1988, Process for electronically maintaining financial records, especially for checkbook balancing and rectification; John W. Freeman, Jr., 364/406; 235/379; 364/408, 705.02, 715.01; 902/24, 27 [IMAGE AVAILABLE]
24. 4,703,953, Nov. 3, 1987, Note paper dispensing and record retaining device; Bill R. Woods, 462/32; 101/225; 281/6 [IMAGE AVAILABLE]
25. 4,703,511, Oct. 27, 1987, Writing input and dynamics regeneration device; Paul Conoval, 382/182; 347/171; 382/119, 232 [IMAGE AVAILABLE]
26. 4,700,906, Oct. 20, 1987, Paper tape control unit; Theodore P. Lapadakis, 242/538.1; 235/58CF; 242/423, 538.2, 538.3, 540, 546, 546.1; 400/614; D18/12 [IMAGE AVAILABLE]
27. 4,654,874, Mar. 31, 1987, Electronic device with a finger activating data input function; Haruo Yamamoto, 382/315 [IMAGE AVAILABLE]

28. 4,578,811, Mar. 25, 1986, Key-in device; Naoki Inagaki, 382/182, 187, 202 [IMAGE AVAILABLE]

29. 4,523,235, Jun. 11, 1985, Electronic microcopier apparatus; Jan Rajchman, 358/472; 347/171; 358/473; 382/314; 400/29, 73, 88 [IMAGE AVAILABLE]

30. 4,516,262, May 7, 1985, Character data processing apparatus; Akira Sakurai, 382/185, 192, 199, 224 [IMAGE AVAILABLE]

31. 4,385,461, May 31, 1983, Sequentially highlighting copy holder; Hale Wingfield, 40/352, 341, 442, 902; 400/711, 716 [IMAGE AVAILABLE]

32. 4,317,109, Feb. 23, 1982, Pattern recognition system for hand-written characters operating on an on-line real-time basis; Kazumi Odaka, et al., 382/187, 201, 218 [IMAGE AVAILABLE]

33. 4,276,541, Jun. 30, 1981, Display control of hand-written, memorized pattern at a preselected time; Tomohiro Inoue, et al., 382/189; 364/705.06, 926, 926.1, 927.2, 927.5, 927.6, 927.64, 927.7, 928, 928.1, 928.2, 929.1, 939, 939.3, 942.7, 947, 947.2, 948.1, 957, 957.1, 967, 967.1, DIG.2; 368/9, 108, 251; 382/100, 313, 324; 968/895, 967, DIG.1 [IMAGE AVAILABLE]

=> s pen# or stylus

21871 PEN#

8183 STYLUS

L4 28615 PEN# OR STYLUS

=> d his

(FILE 'USPAT' ENTERED AT 11:01:32 ON 08 SEP 95)

SET PAGELENGTH 62

SET LINELENGTH 78

L1 12878 S CALCULATOR#

L2 1813 S HANDWRIT####

L3 33 S L1(2P)L2

L4 28615 S PEN# OR STYLUS

08 SEP 95 11:03:18

U.S. Patent & Trademark Office

P0005

=> s l4 and l3

L5 19 L4 AND L3

=> d l5 1-19

1. 5,428,805, Jun. 27, 1995, Method and apparatus for recognizing and performing handwritten calculations; Michael W. Morgan, 395/800; 345/173, 179; 364/231.2, 231.3, 231.31, 237.2, 237.5, 286.1, 286.3, DIG.1 [IMAGE AVAILABLE]

2. 5,396,443, Mar. 7, 1995, Information processing apparatus including arrangements for activation to and deactivation from a power-saving state; Michihiro Mese, et al., 364/707 [IMAGE AVAILABLE]

3. 5,315,667, May 24, 1994, On-line handwriting recognition using a prototype confusability dialog; Tetsunosuke Fujisaki, et al., 382/187, 311 [IMAGE AVAILABLE]

4. 5,303,312, Apr. 12, 1994, Handwriting recognition by character template;

Liam D. Comerford, et al., 382/189, 182, 209, 254 [IMAGE AVAILABLE]

5. 5,294,792, Mar. 15, 1994, Writing tip position sensing and processing apparatus; Russell F. Lewis, et al., 250/221, 226; 345/163, 180; 382/121, 188 [IMAGE AVAILABLE]

6. 5,276,794, Jan. 4, 1994, Pop-up keyboard system for entering handwritten data into computer generated forms; Arthur C. Lamb, Jr., 395/149; 345/173; 382/189; 395/157, 161 [IMAGE AVAILABLE]

7. 5,258,935, Nov. 2, 1993, Self-inputting checkbook accounting device; Michael J. Ure, 364/705.02, 705.03, 709.11 [IMAGE AVAILABLE]

8. 5,187,351, Feb. 16, 1993, Processing of bank documents; John G. Clary, 235/379, 449, 454; 902/5 [IMAGE AVAILABLE]

9. 5,133,076, Jul. 21, 1992, Hand held computer; Jeff C. Hawkins, et al., 395/800; 364/231, 231.1, 231.2, 709.09 [IMAGE AVAILABLE]

10. 5,023,918, Jun. 11, 1991, Cross-product filter; James S. Lipscomb, 382/260, 187, 197, 202 [IMAGE AVAILABLE]

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12. 4,771,268, Sep. 13, 1988, Character recognition device; Hironao Sone, et al., 341/22, 5; 382/188 [IMAGE AVAILABLE]

13. 4,763,356, Aug. 9, 1988, Touch screen form entry system; Benjamin W. Day, Jr., et al., 379/368; 178/18; 345/113, 173, 902; 364/DIG.2; 379/201, 396; 395/100, 149, 155, 161 [IMAGE AVAILABLE]

14. 4,703,953, Nov. 3, 1987, Note paper dispensing and record retaining device; Bill R. Woods, 462/32; 101/225; 281/6 [IMAGE AVAILABLE]

15. 4,703,511, Oct. 27, 1987, Writing input and dynamics regeneration device; Paul Conoval, 382/182; 347/171; 382/119, 232 [IMAGE AVAILABLE]

16. 4,578,811, Mar. 25, 1986, Key-in device; Naoki Inagaki, 382/182, 187, 202 [IMAGE AVAILABLE]

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U.S. Patent & Trademark Office

P0006

17. 4,523,235, Jun. 11, 1985, Electronic microcopier apparatus; Jan Rajchman, 358/472; 347/171; 358/473; 382/314; 400/29, 73, 88 [IMAGE AVAILABLE]

18. 4,317,109, Feb. 23, 1982, Pattern recognition system for hand-written characters operating on an on-line real-time basis; Kazumi Odaka, et al., 382/187, 201, 218 [IMAGE AVAILABLE]

19. 4,276,541, Jun. 30, 1981, Display control of hand-written, memorized pattern at a preselected time; Tomohiro Inoue, et al., 382/189; 364/705.06, 926, 926.1, 927.2, 927.5, 927.6, 927.64, 927.7, 928, 928.1, 928.2, 929.1, 939, 939.3, 942.7, 947, 947.2, 948.1, 957, 957.1, 967, 967.1, DIG.2; 368/9, 108, 251; 382/100, 313, 324; 968/895, 967, DIG.1 [IMAGE AVAILABLE]

=> d his

(FILE 'USPAT' ENTERED AT 11:01:32 ON 08 SEP 95)

SET PAGELength 62

SET LINELENGTH 78

L1 12878 S CALCULATOR#  
L2 1813 S HANDWRIT###  
L3 33 S L1(2P)L2  
L4 28615 S PEN# OR STYLUS  
L5 19 S L4 AND L3

=> set highligh off  
SET COMMAND COMPLETED

=> s l4  
21871 PEN#  
8183 STYLUS  
L6 28615 PEN# OR STYLUS

=> set highligh on  
SET COMMAND COMPLETED

=> s l6 and l3  
L7 19 L6 AND L3

=> d l7 1-19

1. 5,428,805, Jun. 27, 1995, Method and apparatus for recognizing and performing handwritten calculations; Michael W. Morgan, 395/800; 345/173, 179; 364/231.2, 231.3, 231.31, 237.2, 237.5, 286.1, 286.3, DIG.1 [IMAGE AVAILABLE]

2. 5,396,443, Mar. 7, 1995, Information processing apparatus including arrangements for activation to and deactivation from a power-saving state; Michihiro Mese, et al., 364/707 [IMAGE AVAILABLE]

3. 5,315,667, May 24, 1994, On-line handwriting recognition using a prototype confusability dialog; Tetsunosuke Fujisaki, et al., 382/187, 311 [IMAGE AVAILABLE]

4. 5,303,312, Apr. 12, 1994, Handwriting recognition by character template; Liam D. Comerford, et al., 382/189, 182, 209, 254 [IMAGE AVAILABLE]

5. 5,294,792, Mar. 15, 1994, Writing tip position sensing and processing apparatus; Russell F. Lewis, et al., 250/221, 226; 345/163, 180; 382/121, 188  
08 SEP 95 11:05:19 U.S. Patent & Trademark Office P0007  
[IMAGE AVAILABLE]

6. 5,276,794, Jan. 4, 1994, Pop-up keyboard system for entering handwritten data into computer generated forms; Arthur C. Lamb, Jr., 395/149; 345/173; 382/189; 395/157, 161 [IMAGE AVAILABLE]

7. 5,258,935, Nov. 2, 1993, Self-inputting checkbook accounting device; Michael J. Ure, 364/705.02, 705.03, 709.11 [IMAGE AVAILABLE]

8. 5,187,351, Feb. 16, 1993, Processing of bank documents; John G. Clary, 235/379, 449, 454; 902/5 [IMAGE AVAILABLE]

9. 5,133,076, Jul. 21, 1992, Hand held computer; Jeff C. Hawkins, et al., 395/800; 364/231, 231.1, 231.2, 709.09 [IMAGE AVAILABLE]
10. 5,023,918, Jun. 11, 1991, Cross-product filter; James S. Lipscomb, 382/260, 187, 197, 202 [IMAGE AVAILABLE]
11. 4,899,137, Feb. 6, 1990, Arrangement for the input and processing of characters and/or graphic patterns; Herbert Behrens, et al., 345/168; 178/18; 341/5; 345/173 [IMAGE AVAILABLE]
12. 4,771,268, Sep. 13, 1988, Character recognition device; Hironao Sone, et al., 341/22, 5; 382/188 [IMAGE AVAILABLE]
13. 4,763,356, Aug. 9, 1988, Touch screen form entry system; Benjamin W. Day, Jr., et al., 379/368; 178/18; 345/113, 173, 902; 364/DIG.2; 379/201, 396; 395/100, 149, 155, 161 [IMAGE AVAILABLE]
14. 4,703,953, Nov. 3, 1987, Note paper dispensing and record retaining device; Bill R. Woods, 462/32; 101/225; 281/6 [IMAGE AVAILABLE]
15. 4,703,511, Oct. 27, 1987, Writing input and dynamics regeneration device; Paul Conoval, 382/182; 347/171; 382/119, 232 [IMAGE AVAILABLE]
16. 4,578,811, Mar. 25, 1986, Key-in device; Naoki Inagaki, 382/182, 187, 202 [IMAGE AVAILABLE]
17. 4,523,235, Jun. 11, 1985, Electronic microcopier apparatus; Jan Rajchman, 358/472; 347/171; 358/473; 382/314; 400/29, 73, 88 [IMAGE AVAILABLE]
18. 4,317,109, Feb. 23, 1982, Pattern recognition system for hand-written characters operating on an on-line real-time basis; Kazumi Odaka, et al., 382/187, 201, 218 [IMAGE AVAILABLE]
19. 4,276,541, Jun. 30, 1981, Display control of hand-written, memorized pattern at a preselected time; Tomohiro Inoue, et al., 382/189; 364/705.06, 926, 926.1, 927.2, 927.5, 927.6, 927.64, 927.7, 928, 928.1, 928.2, 929.1, 939, 939.3, 942.7, 947, 947.2, 948.1, 957, 957.1, 967, 967.1, DIG.2; 368/9, 108, 251; 382/100, 313, 324; 968/895, 967, DIG.1 [IMAGE AVAILABLE]

=> d 17 4 kwic

US PAT NO: 5,303,312 [IMAGE AVAILABLE]

L7: 4 of 19

SUMMARY:

BSUM(16)

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P0008

US PAT NO: 5,303,312 [IMAGE AVAILABLE]

L7: 4 of 19

BSUM(16)

An . . . difference between the user entered "stroke" and the displayed segments. The methodology described cannot easily be expanded to support cursive handwriting entry or logic or flow chart capture.

## SUMMARY:

BSUM(17)

U.S. . . . a stylus-operated two-by-two switch array for generating numbers on a small pad, such as might be found on a watch **calculator**. The patent describes how different numbers can be generated by different sequences of "strokes" on the array. There is no. . .

## SUMMARY:

BSUM(18)

In . . . segments of a single character display. The user creates characters by pushing buttons. No use is made of the natural **handwriting** style of the user.

## SUMMARY:

BSUM(19)

U.S. . . . markings which constrict the writing of the characters in the box." While this system does present a user interface for **handwriting** input and a mechanism for displaying to the user each entered character as it is recognized, it has no dialogue. . .

=&gt; d 17 5 kwic

US PAT NO: 5,294,792 [IMAGE AVAILABLE]

L7: 5 of 19

## SUMMARY:

BSUM(4)

However, Texas Instruments has recently (summer of 1991) provided a commercial product that is approximately the size of a hand-held **calculator** and contains a small writing surface upon which **handwriting** may be sensed and recognized. This device also contains a screen that displays the recognized characters or symbols as they. . .

=&gt; d 17 6 kwic

US PAT NO: 5,276,794 [IMAGE AVAILABLE]

L7: 6 of 19

## DETD(16)

Additionally, **handwritten** data may be entered into the pop-up keyboard display area in the same manner as described above for entry of. . . especially useful for entering symbols such as punctuation marks, symbols, and lower-case letters that may not be recognizable by the **handwriting**

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P0009

US PAT NO: 5,276,794 [IMAGE AVAILABLE]

L7: 6 of 19

DETD(16)

recognition algorithm. The OK control button is touched to enter the data displayed in the pop-up keyboard display area 62s. . .

DETD(DESC:

DETD(18)

During . . . area. For example, the alphabetic keyboard depicted in FIG. 4A would be associated with Customer Name field area and the **calculator** type keyboard depicted in FIG. 4B would be associated with Price field area.

=&gt; d 17 7 kwic

US PAT NO: 5,258,935 [IMAGE AVAILABLE]

L7: 7 of 19

DETD(DESC:

DETD(2)

Referring . . . device 1 of the present invention resembles an ordinary checkbook of the carbon type with the addition of a checkbook **calculator**/balance keeper 3 coupled by a wire pair 5 to a pad 7. The **calculator**/balance keeper is preferably of low-power CMOS construction and preferably includes a number of "permanent" storage locations greater than the number. . .

DETD(DESC:

DETD(3)

According . . . printed on the check so as to produce X and Y potentials corresponding to the position of the pen. The **calculator**/balance keeper is programmed to, upon receiving time varying X and Y signals across the wire pair as illustrated schematically in FIG. 2, exit a standard **calculator** mode and enter a numeric decode mode wherein numerals written in the check amount box are decoded to detect the. . . although interpretation of those signals is accomplished differently. The starting-and-ending-vector detection method to be described allows for variation in individual **handwriting** and is independent of the size of the numerals, allowing the last two numerals to be interpreted as the cents. . .

=&gt; d 17 8 kwic

US PAT NO: 5,187,351 [IMAGE AVAILABLE]

L7: 8 of 19

DETD(DESC:

DETD(12)

Reference . . . of the six checks is \$4234.90. In accordance with ordinary procedure the teller will use the same computer terminal or **calculator** to print the Batch Report that was previously used for keying in each check as it was received. Before handing. . .

DETD(DESC:

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U.S. Patent &amp; Trademark Office

P0010



US PAT NO: 5,187,351 [IMAGE AVAILABLE]

L7: 8 of 19

DETD(14)

Reference . . . portion of a check that has been cashed, processed in the presently conventional fashion, and returned by the bank. The **handwritten** amount of the check is \$2029.50. It will also be seen that in the lower right hand corner the amount. . .

=&gt; d 17 11 kwic

US PAT NO: 4,899,137 [IMAGE AVAILABLE]

L7: 11 of 19

DETD(14)

DETD(14)

In . . . typewriter key field 24 and a second key field 25 which is configured to correspond to the keyboard of a **calculator** and/or a function keyboard. In this embodiment, both the typewriter key field 24 and the second key field 25 are. . . 27 is actuated by opening of the key field 25 of the unit 110 to trigger automatic switching from the **calculator** keyboard mode to the graphics mode. The input surface 26, which is exposed by the opening of the key field 25, can be used to input **handwritten** and/or graphic characters or patterns. The input surface 26 can also be provided with cursor control devices as shown in. . .

DETD(14)

DETD(15)

As . . . Also, the input surface 26 can be provided with a reproduction of the keys of the key field 25 (e.g., **calculator** keys) in the form of an imprint on the input surface 26.

=&gt; d 17 12 kwic

US PAT NO: 4,771,268 [IMAGE AVAILABLE]

L7: 12 of 19

DETD(14)

DETD(25)

Sixteen . . . can be detected. Therefore, even if a complicated character input is applied to the character recognition device, the character input **handwritten** by way of the contacting positions can be accurately recognized.

DETD(14)

DETD(27)

The . . . apparatus which requires an input of character and numeric characters or other electronic apparatus such as, for example, small-sized electronic **calculators** or microcomputers within the scope and spirit of the present invention.

=> d 17 13 kwic  
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P0011

US PAT NO: 4,763,356 [IMAGE AVAILABLE]

L7: 13 of 19

DETDESC:

DETD(33)

Other . . . 35 displays a menu of predefined "tools" as will be discussed below. The STYLUS key 36 changes the style of **handwriting** displayed in a bit-mapped graphics field of form 30 to either fine or bold point writing. The CLEAR key 37. . .

DETDESC:

DETD(35)

Turning . . . in a field when the date to be inserted is not the current date. The user may bring up a **calculator** tool (not shown) by touching item 7. The **calculator** tool is similar in appearance to a conventional hand-held **calculator** and includes four registers. The user operates the displayed **calculator** as though the user was operating a hand-held **calculator**. The user may also bring up the four **calculator** registers (not shown) without bringing up the **calculator** by touching menu item 8.

=> d 17 14 kwic

US PAT NO: 4,703,953 [IMAGE AVAILABLE]

L7: 14 of 19

DETDESC:

DETD(5)

An . . . of the continuous roll 38, with a combination of both also being acceptable. In any event, when a note is **handwritten** on the top surface of the roll of paper 46 with a writing instrument, such as a pen or pencil,. . .

DETDESC:

DETD(7)

A . . . 58 allow their protrusion when the unitary enclosure 66 is shut. Inset into the enclosure 66 is a self-contained electronic **calculator** 72, preferably containing an integral clock sharing a solid state digital readout, also having its own power supply in the. . .

=> d 17 15 kwic

US PAT NO: 4,703,511 [IMAGE AVAILABLE]

L7: 15 of 19

DETDESC:

DETD(47)

The output of 28 can be further processed by dynamics **calculator** 29

wherein writing velocity and acceleration is computer. Herein the distance between spatial coordinates of time consecutive bits are computed. . .

DETDESC:

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U.S. Patent & Trademark Office

P0012

US PAT NO: 4,703,511 [IMAGE AVAILABLE]

L7: 15 of 19

DETD(48)

The . . . accomplished by mapping writing dynamics data into the associated written character. Many prior art techniques exist for the recognition of handwritten characters using writing dynamics input information.

DETDESC:

DETD(49)

The present invention is used in combination with handwriting recognition means as illustrated in FIG. 4 wherein the output of writing sorter 28 and dynamics calculator 29 are provided to handwriting recognition means 30. Handwriting recognition means 30 translates the received writing dynamics data into the predefined character associated therewith.

=> d 17 16 kwic

US PAT NO: 4,578,811 [IMAGE AVAILABLE]

L7: 16 of 19

SUMMARY:

BSUM(7)

Accordingly, . . . invention is to provide a key-in device with a simple structure, which device is capable of inputting characters in a handwriting manner by using ten keys, function keys, etc., which keys are generally provided in ordinary calculators.

SUMMARY:

BSUM(8)

To . . . a matrix array of keys; memory means connected to the key-in section, which, when a character is input by the handwriting method, receives coordinate data corresponding to individual actuated keys in the key-in section, forms an input pattern on the character input by the handwriting method, on the basis of the coordinate data, and stores the input pattern; standard pattern memory means for previously storing. . .

SUMMARY:

BSUM(9)

With such an arrangement, the key-in device according to this invention can recognize characters input in a handwriting manner, displaying them as characters with a standard predetermined configuration. Said key-in device can also be simple in structure, using keys such as those used in ordinary

**calculators.**

DETD(DESC):

DETD(2)

The example to follow is a **calculator** into which a key-in device according to the present invention has been incorporated. In FIG. 1 illustrating an  
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US PAT NO: 4,578,811 [IMAGE AVAILABLE] L7: 16 of 19

DETD(2)

outside view of the **calculator**, a main frame 1 is provided with a display section 2 and a keyboard 3 on the obverse side. The . . . 1 sets up a calculation mode in which the keys respectively exhibit their own functions. Mode 2 sets up a **handwriting** input mode in which hand written characters may be input from the finger actuation section 4.

DETD(DESC):

DETD(3)

In a **handwriting** input mode, numerals 0-9, alphabetic characters A-Z, and the arithmetic symbols +, -, .times. and .div. may be relatively displayed.  
. . .

DETD(DESC):

DETD(4)

An . . . key code representing the function originally assigned to each key and sends it to a control section 20. In a **handwriting** mode, it generates coordinate data of the operated data in the finger actuation section 4 and sends it to a . . .

DETD(DESC):

DETD(6)

When the calculation mode is set up by means of the MODE key 6, the circuits in the **calculator** may be caused to operate in the same manner as the **calculator** operates in the usual calculating mode, by actuating the ten keys and function keys on the keyboard 3. When the **handwriting** mode is set up by operating the MODE key 6, by actuating the keys in the finger actuation section 4. . . to the memory register (not shown) in the memory section 30, for storage. If a sentence is stored therein, the **calculator** can be used as a simple memorandum. After the operation of the CAL key 5, if the numerals and arithmetic. . .

DETD(DESC):

DETD(8)

With . . . depicts a desired character with the finger on the finger actuation section 4 with a 5.times.6 matrix array, when the **calculator** is in the **handwriting** mode. In such a case, in response to the key actuation,

the key judging section 11 produces coordinate data, which. . .

DETD(9)

DETD(9)

Let . . . in a fixed direction, it is considered the stroke feature. In this case, when a character is further input by **handwriting** in the same direction and the sum is above 2 or -2, such input indicates the same feature as the. . .

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U.S. Patent & Trademark Office

P0014

US PAT NO: 4,578,811 [IMAGE AVAILABLE]

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DETD(9)

DETD(9)

DETD(11)

The . . . for one character in the example of FIG. 9. The reason for this is that the character input by the **handwriting** may slightly be deformed during the **handwriting** operation, and even in such case, the recognition of such a deformed character is enabled. Specifically, the plurality of the. . . display. When the second matching section 17 fails to have the same second standard pattern as the second feature, the **calculator** judges this situation as one in which the input character cannot be recognized, and performs a reject processing operation.

=> d 17 17 kwic

US PAT NO: 4,523,235 [IMAGE AVAILABLE]

L7: 17 of 19

DETD(9)

DETD(96)

In . . . box like copier which allows a wider sweep to be copied in a single stroke. The box can contain a **calculator** or small computer as in embodiment 320. In the sixth embodiment 400 a pen-like copier is described that generally resembles. . .

DETD(9)

DETD(98)

A pen-like hand-held copier according to the invention can typically store one or two lines of typewritten, printed or **handwritten** text as fast as the line or lines can be manually swept. Similarly, the line or lines can be written. . .

DETD(9)

DETD(99)

A . . . of such capacity will become physically smaller and less costly. It is natural to combine a box-like copier with a **calculator** or a small

computer as in embodiment 320. The display 324 of the **calculator** 320 can be used for a "soft" read-out of the stored information.

DETDESC:

DETD(100)

While . . . text, the instrument can be used to copy any patterns of black and white. A very important application is for **handwritten** text. Another most important application is for Chinese and Japanese characters. It is also very useful for copying records of. . .

=> d 17 18 kwic

08 SEP 95 11:13:21

U.S. Patent & Trademark Office

P0015

US PAT NO: 4,317,109 [IMAGE AVAILABLE]

L7: 18 of 19

CLAIMS:

CLMS(1)

What is claimed is:

1. A pattern recognition system for **handwritten** characters operating on an on-line real-time basis comprising:
  - (a) a character input unit for providing the coordinates of a plurality. .  
. for providing the coordinates of the feature points for each stroke of a plurality of reference characters,
  - (e) a stroke difference **calculator** for providing a stroke difference p.sub.i which is the sum of the length between the feature points of the k'th. . .

=> d 17 19 kwic

US PAT NO: 4,276,541 [IMAGE AVAILABLE]

L7: 19 of 19

CLAIMS:

CLMS(7)

7. A combination timepiece and **calculator** comprising:
  - a matrix display panel;
  - a current time information keeping circuit for providing current time information therein;
  - a computation circuit for performing **calculator** operations;
  - keyboard means for introducing desired information into said computation circuit;
  - matrix input means including a plurality of elements for introducing a desired hand-written pattern into said combination timepiece and **calculator** to be displayed on said matrix display panel;
  - matrix memory means including a plurality of blocks for storing said hand-written pattern. . . storing said desired time therein introduced via said alarm time input means;
  - block selection switch means on said combination timepiece and **calculator** for directly accessing one of said blocks of said matrix memory means and of said alarm time memory means for storage of said **handwritten** pattern and said desired time therein;

a detection circuit for comparing the current time information provided by said current time information. . .

## CLAIMS:

## CLMS(8)

8. The combination timepiece and **calculator** of claim 7, further comprising: a character pattern generator interposed between said computation circuit and said matrix display panel for. . .

## CLAIMS:

## CLMS(9)

9. The combination timepiece and **calculator** of claim 7, wherein each block of said matrix memory means includes a second number of digit positions, and  
08 SEP 95 11:13:40 U.S. Patent & Trademark Office P0016

US PAT NO: 4,276,541 [IMAGE AVAILABLE] L7: 19 of 19

## CLMS(9)

wherein. . .

=> d his

(FILE 'USPAT' ENTERED AT 11:01:32 ON 08 SEP 95)

SET PAGELENGTH 62

SET LINELENGTH 78

L1 12878 S CALCULATOR#  
L2 1813 S HANDWRIT####  
L3 33 S L1(2P)L2  
L4 28615 S PEN# OR STYLUS  
L5 19 S L4 AND L3  
SET HIGHLIGHT OFF  
L6 28615 S L4  
SET HIGHLIGHT ON  
L7 19 S L6 AND L3

=> d l3 11 kwic

US PAT NO: 5,241,489 [IMAGE AVAILABLE] L3: 11 of 33

## DETD(10)

## DETD(10)

In . . . in FIG. 3. As can be seen from FIG. 5, since the fraction is displayed in a format closer to **handwriting**, the displayed fraction is that much easier for the operator to recognize.

## DETD(11)

## DETD(11)

FIG. 6 shows an algorithm for processing the display of a fraction entered in another **calculator** according to the invention which has a similar

structure as the **calculator** of FIG. 1. In FIG. 6, X, Y and A respectively indicate variables for storing the number of digits of. . .

=> d 13 27 kwic

US PAT NO: 4,654,874 [IMAGE AVAILABLE]

L3: 27 of 33

DETDISC:

DETD(2)

Reference is made to FIG. 1 illustrating an external view of a hand-held electronic **calculator** incorporating the present invention. In the figure, a case 1 of the **calculator** has a display section 2 with a key section 3 on the left half and a finger activating input section. . . memory, a mode key for selecting a mode 1 and a mode 2, and the like. In mode 1, the **calculator** operates in a normal calculation mode. In this mode, the respective keys function normally. In mode 2, the electronic device. . .

DETDISC:

08 SEP 95 11:17:02

U.S. Patent & Trademark Office

P0017

US PAT NO: 4,654,874 [IMAGE AVAILABLE]

L3: 27 of 33

DETD(4)

The operation of the **calculator** thus far described will be given referring to a flow chart shown in FIG. 3. The register D in the. . . is checked whether the keyed-in data before the time interval terminates is present or not. When the character A is **handwritten**, as in the above case, the pattern data is stored in the input pattern memory 13a. Accordingly, step S14 is. . .

=> d his

(FILE 'USPAT' ENTERED AT 11:01:32 ON 08 SEP 95)

SET PAGELENGTH 62

SET LINELENGTH 78

L1 12878 S CALCULATOR#

L2 1813 S HANDWRIT####

L3 33 S L1(2P)L2

L4 28615 S PEN# OR STYLUS

L5 19 S L4 AND L3

SET HIGHLIGHT OFF

L6 28615 S L4

SET HIGHLIGHT ON

L7 19 S L6 AND L3

=> s handwritten calculation#

1178 HANDWRITTEN

89231 CALCULATION#

L8 1 HANDWRITTEN CALCULATION#

(HANDWRITTEN(W) CALCULATION#)

=> d 18

1. 5,428,805, Jun. 27, 1995, Method and apparatus for recognizing and



performing handwritten calculations; Michael W. Morgan, 395/800; 345/173, 179; 364/231.2, 231.3, 231.31, 237.2, 237.5, 286.1, 286.3, DIG.1 [IMAGE AVAILABLE]

=> s calculation#(10a) (l1 or hand)

89231 CALCULATION#

627853 HAND

L9 2372 CALCULATION#(10A) (L1 OR HAND)

=> s l9 and l4

L10 120 L9 AND L4

=> s l9(p)l4

L11 10 L9(P)L4

=> d l11 1-10

1. 5,428,805, Jun. 27, 1995, Method and apparatus for recognizing and performing handwritten calculations; Michael W. Morgan, 395/800; 345/173, 179; 364/231.2, 231.3, 231.31, 237.2, 237.5, 286.1, 286.3, DIG.1 [IMAGE AVAILABLE]

2. 5,180,133, Jan. 19, 1993, Clipboard having a calculator mounted thereon; Shih-Ho Chang, 248/452, 176, 205.2, 314, 441.1; D18/2 [IMAGE AVAILABLE]  
08 SEP 95 11:19:44 U.S. Patent & Trademark Office P0018

3. 4,659,874, Apr. 21, 1987, X-Y position sensor; Waldo L. Landmeier, 178/19 [IMAGE AVAILABLE]

4. 4,523,235, Jun. 11, 1985, Electronic microcopier apparatus; Jan Rajchman, 358/472; 347/171; 358/473; 382/314; 400/29, 73, 88 [IMAGE AVAILABLE]

5. 4,414,634, Nov. 8, 1983, Fluid flow totalizer; Timothy R. Louis, et al., 364/510; 73/861.03; 364/465 [IMAGE AVAILABLE]

6. 4,404,643, Sep. 13, 1983, Portable electronic calculator with a writing instrument; Shin Ojima, et al., 364/705.03; 361/680, 681; 364/708.1; 401/52, 105, 195 [IMAGE AVAILABLE]

7. 4,308,951, Jan. 5, 1982, Collapsible book support and organizer; Ellis Walker, Jr., 206/214, 371; 220/335, 520; 248/447, 460 [IMAGE AVAILABLE]

8. 4,151,596, Apr. 24, 1979, Calculator interface; Joseph A. Howells, 364/709.11; 345/156; 364/927, 927.1, 927.2, 927.5, 928, 929.2, 937.1, 939, 939.2, 939.3, 942.8, 949, 951.1, 951.4, DIG.2 [IMAGE AVAILABLE]

9. 4,141,073, Feb. 20, 1979, Keyless electronic calculating pen; Lu-Jan Tan, 364/705.03, 709.11; 382/186, 189 [IMAGE AVAILABLE]

10. 4,044,600, Aug. 30, 1977, Tire cure and heat transfer simulator; William E. Claxton, et al., 374/53; 264/236; 364/473, 806; 374/134; 425/29, 170 [IMAGE AVAILABLE]

=> d l11 2 kwic

US PAT NO: 5,180,133 [IMAGE AVAILABLE]

L11: 2 of 10

## SUMMARY:

BSUM(5)

**Calculators** are useful tools for mathematical **calculations**. Typically, a pocket **calculator** is mounted on a clipboard to obviate the inconvenience caused by the necessity of positioning the calculator with one of the user's hands while the user's other hand holds a **pen** to write on the clipboard. Referring to FIGS. 1 to 3 U.S. Design Pat. No. 284,678 disclosed a clipboard comprises. . .

=&gt; d l11 6 kwic

US PAT NO: 4,404,643 [IMAGE AVAILABLE]

L11: 6 of 10

DEIDESC:

DEID(17)

Since . . . 12 is used as described above, the operation part of the calculator does not provide any hindrance when the ball-point **pen** is used or the calculator is inserted into and taken out of a pocket. Further, when a push-button switch is. . . 11 has assembled therewith the reinforcement plate 22 as described previously, it is also possible to take notes while conducting **calculations**. This **calculator** is of rectangular, elongated configuration, for example, about 1.5 cm wide, about 12 cm long and 5 mm thick; accordingly, it can easily be used as a ball-point **pen** when the cover 12 is in place, and when it is to be used as a calculator the body 11.

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U.S. Patent &amp; Trademark Office

P0019

US PAT NO: 4,404,643 [IMAGE AVAILABLE]

L11: 6 of 10

DEID(17)

. . .

=&gt; d l11 8 kwic

US PAT NO: 4,151,596 [IMAGE AVAILABLE]

L11: 8 of 10

## SUMMARY:

BSUM(3)

In . . . information into the hand-held calculator via the calculator keyboard. One instance where this procedure might be followed is where a **hand-held calculator** is used to store data and perform **calculations** on numerical information generated by a graphical digitizer which produces digital information, generally in a binary coded form, representative of the instantaneous position of a movable element such as a **stylus** or cursor. In such case, the necessity of having an operator read output information from the graphical digitizer and manually. . .

=&gt; d l11 9 kwic

US PAT NO: 4,141,073 [IMAGE AVAILABLE]

L11: 9 of 10

## SUMMARY:

BSUM(4)

Electronic . . . cost is greatly reduced. It is well known that key panel operation is indispensable during use of an ordinary electronic **calculator**, and in order to record during **calculation**, paper and **pen** are necessary accessories which sometimes are not available at hand. For larger size desk top type calculators, a paper roll. . . with a small pad of paper and a minipen as a pocket-book set for convenience. A commodity so called a **calcu-pen** has been marketed in the form of an aggregated key-operated **calculator** and **pen**. However, independent operations for note taking and **calculation** are required. More recently, a **calculator** has been disclosed with an electronic **pen** connected to the calculator by a conductive lead, instead of conventional key operation, and the **pen** is used to carryout the calculation. Yet drawbacks remain to be improved upon, since the said electronic **pen** has to be used with a specifically designed plate or with the aid of certain mediums and the numerals and. . .

=&gt; d his

(FILE 'USPAT' ENTERED AT 11:01:32 ON 08 SEP 95)

SET PAGELENGTH 62

SET LINELENGTH 78

L1 12878 S CALCULATOR#

L2 1813 S HANDWRIT####

L3 33 S L1(2P)L2

L4 28615 S PEN# OR STYLUS

L5 19 S L4 AND L3

SET HIGHLIGHT OFF

L6 28615 S L4

SET HIGHLIGHT ON

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P0020

L7 19 S L6 AND L3

L8 1 S HANDWRITTEN CALCULATION#

L9 2372 S CALCULATION#(10A) (L1 OR HAND)

L10 120 S L9 AND L4

L11 10 S L9(P)L4

=&gt;